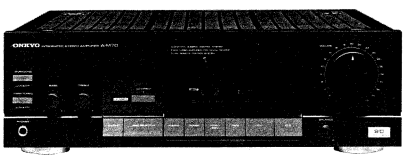
SERIAL No. 32[illegible]

ONKYO® SERVICE MANUAL

Integrated Stereo Amplifier
MODEL A-M70



UG	220V AC, 50Hz
UQ (A, B)	240V AC, 50Hz
UW	120V/220V AC, 50Hz/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

TABLE OF CONTENTS

Specifications 2
Precautions 2
Block diagram 3
Circuit explanation 4
IC block diagram 5
Chassis exploded view 8
Exploded view parts list 9
Front panel facilities 9
Printed circuit board parts list 10
Packing procedures 12
Printed circuit board view 13
Schematic diagram 17
System connections 19

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Power Output:	50 watts per channel, min. RMS, at 8 ohms, both channels driven from 20Hz to 20kHz, with no more than 0.15% THD.
Total Harmonic Distortion:	0.15% at 50 watts
IM Distortion:	0.1% at 50 watts
Damping Factor:	40 at 8 ohms
Frequency Response:	15–30,000Hz ±1dB
Sensitivity and Impedance:	Phone: 2.5mV 50 kohms Tuner, CD Video/CDV: 150mV/50 kohms Tape, DAT Play: 150mV/50 kohms Tape, DAT Rec: 150mV/4.5 kohms (phono)
Phono Overload:	120mV RMS at 1kHz, 0.5% THD
Bass Control:	±10dB at 100Hz
Treble Control:	±10dB at 10kHz
Signal to noise Ratio:	Phono: 80dB (IHF A), 5mV input CD & Tape: 95dB (IHF A)
Selective Tone Control:	+15dB at 55Hz, +6dB at 10kHz

General

Power Supply:	European models: AC 220V, 50Hz U.K. & Australian models: AC 240V, 50Hz Worldwide models: AC 120V and 220V switchable, 50/60Hz
Dimensions:	360(W) × 116(H) × 347(D)mm 14-3/16" × 4-9/16" × 13-11/15"
Weight:	5.7kg, 12.6lbs.

Specifications are subject to change without notice due to product improvements.

PRECAUTIONS

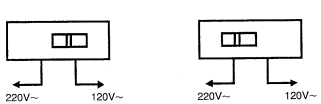
1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F902	252074 or 252074CC	2A-SE-EAK, Primary fuse(220V, 240V, 120V/220V model) 2A-SE-EAK, Primary fuse(220V, 240V, 120V/220V model)
F903	252075 or 252075CC	2.5A-SE-EAK, AC outlet fuse (220V model) 2.5A-SE-EAK, AC outlet fuse (220V model)
F904	252049	4A(ST-6),Primary fuse(120V/220V model)

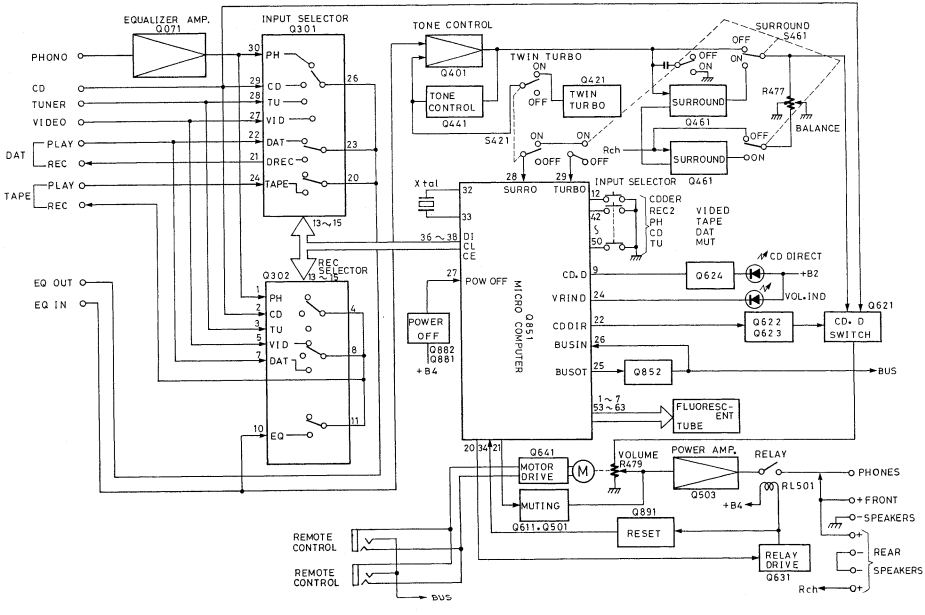
2. Voltage selector (rear panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left, Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply voltage is the same as that of the unit.



WORLDWIDE MODELS ONLY

BLOCK DIAGRAM



CIRCUIT EXPLANATION

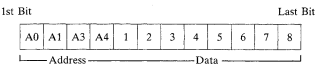
Direct function and input selector circuit

The recent automatic selector circuit (Direct function) functionally has been upgraded from the former selector circuit to include "Super Dubbing, Just Side Dubbing", and the difference from the former circuit is the change to a new microcomputer control.

For the control signal, a serial signal introduction between the various devices loaded on the microcomputer and the bus line is carried out. This signal pattern is 1 block of 12 bits, divided into 4 bits of code and 8 bits of data for control use.

When this amplifier microcomputer Q851 operates the other devices (CD, TUNER, TAPE), the control signal transmitted from the various devices is received by way of the bus line, and after being decoded, in order to switchover the input selector switch IC (Q301, Q302), the control serial signal is output from #56, #57, and #58. Conversely, when the input selector button is pushed, the control signal is transmitted to the input selector IC, and at the same time, the instruction signal is output to the microcomputer of the various devices (CD, TUNER, TAPE), and the devices are caused to operate.

The control of the input selector changeover switch IC Q301, Q302, is carried out by means of input of the designated serial data from the microcomputer to terminals #13, #14, and #15 of CE, DI, and CL. The composition of this control signal is a total of 12 bits, made up of 4 bits of address and 8 bits of data, and because it corresponds to switch No. 1~8 and terminals L1~L8, R1~R8, to turn on the switch the bit is 1, and to turn off the switch, the bit is 0.



For the address, by means of the condition of terminal S, with the use of the chip that is selected, the data transmission is in accordance with the following.

Part name	S terminal	Address			
		A0	A1	A2	A3
LC7821	L	0	1	0	1
	H	1	1	0	1
LC7822	L	0	0	1	1
	H	1	0	1	1

Control terminal

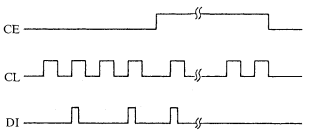
DI ..... Data input terminal

CL ..... Clock input terminal

CE ..... Chip enable terminal

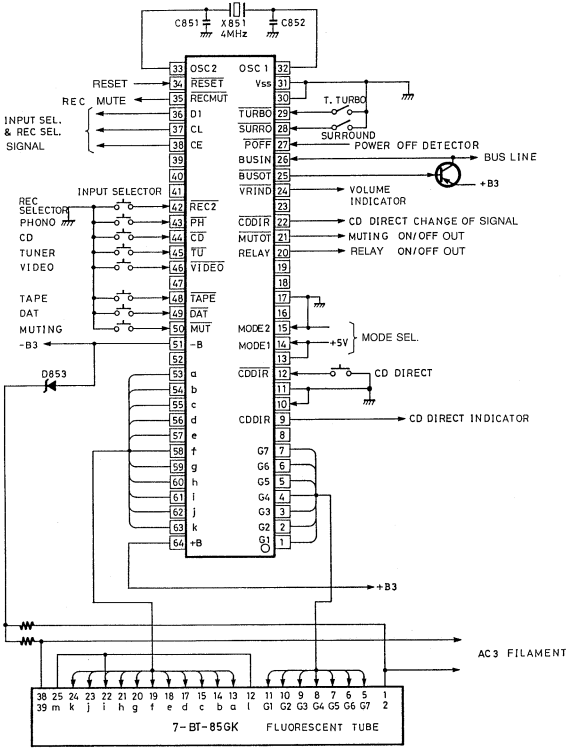
The timing of DI, CL, and CE is in accordance with the following.

The data is taken internally on the rise of CL and latched by the fall of CE.

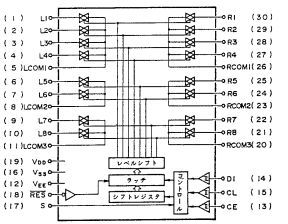


IC BLOCK DIAGRAM

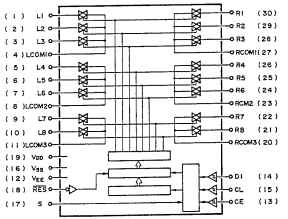
LC6554H-3428 (Micro computer)



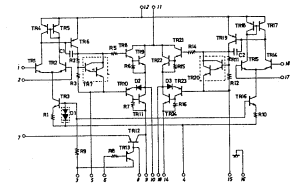
LC7821 (Analog Switch)



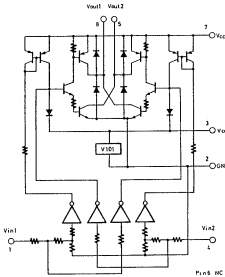
LC7822 (Analog Switch)



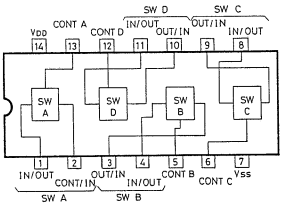
STK-4191V (Powr Amp.)



LB1630 (Motor Drive)



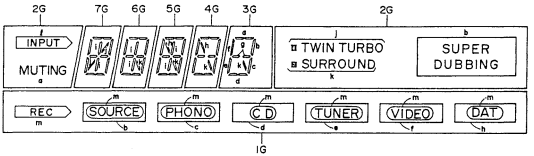
LC4966 (Switch)



TRUTH TABLE

IN 1	IN 2	OUT 1	OUT 2	MOTOR
H	L	H	L	Normal
L	H	L	H	Reverse
H	H	OFF	OFF	Wait
L	L	OFF	OFF	Wait

7-BT-85GK (Fluorescent Indicator Tube)



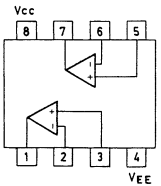
Pin NO.	1	2	3	4	5	6	7	8	9	10
Electrod	F1	F1	NP	NP	7G	6G	5G	4G	3G	2G

Pin NO.	11	12	13	14	15	16	17	18	19	20
Electrod	1G	l	a	b	c	NP	d	e	f	g

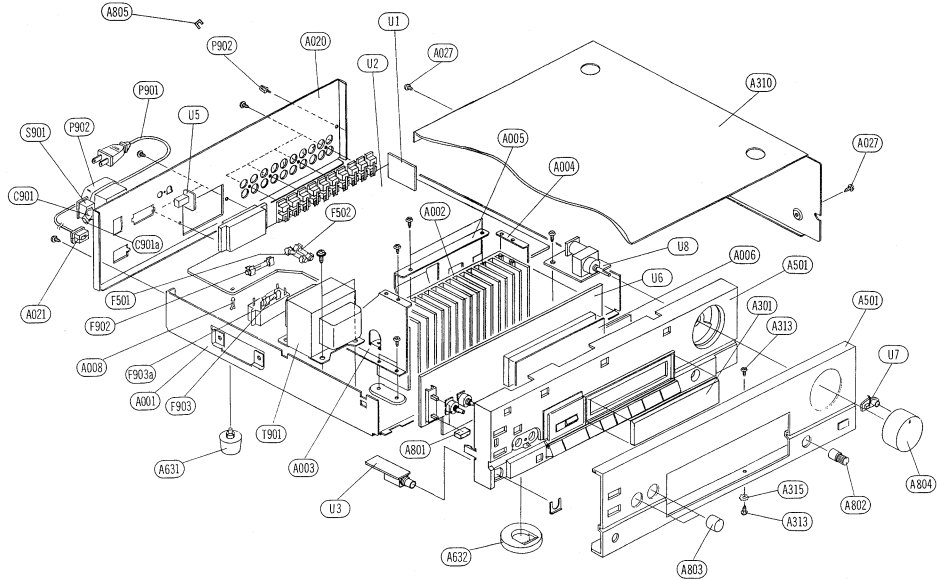
Pin NO.	21	22	23	24	25	26	27	28	29	30
Electrod	h	i	j	k	m	NP	NP	NP	NP	NP

Pin NO.	31	32	33	34	35	36	37	38	39	
Electrod	NP	NP	NP	NP	NP	NP	NP	F2	F2	

μPC4570C (OP Amp.)
NJM4558DX
NJM4558DD



CHASSIS-EXPLODED VIEW



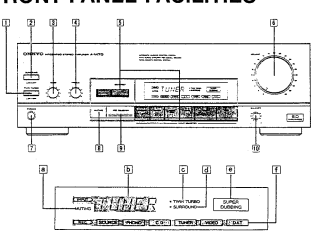
CHASSIS EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A001	27100139-2	CHASSIS
A002	27160210	HEATSINK
A003	27130484	BRACKET, HL
A004	27130481A	BRACKET, HR
A005	27130447	BRACKET, IC
A006	28133185	BACK PLATE
A008	27190524	KGLS-14R, HOLDER
A014	27110369B	FRONT ANGLE
A020	27121129	BACK PANEL [G]
	27121130	BACK PANEL [W][X]
	27121131	BACK PANEL [A][B]
A021	27300750	BUSHING, CABLE
A027	834430088	3TTS+8BBC, TAP-TIGHT SCREW
A501	27210964	FRONT PANEL
(A502)	28135154	BADGE
A301	2819142BA	CLEAR PLATE
A631	27175160	BOTTOM LEG
A632	27175161	BOTTOM LEG (RING)
A310	281843718	TOP COVER
A313	833430080	3TTP+8PBC, TAP-TIGHT SCREW
A315	87313006	M-3BBC, TOOTHED WASHER
A801	28323090	KNOB (PUSH)
A802	28322842-1	KNOB (VOL)
A803	28323091	KNOB (TONE)
A804	28323092	KNOB ASS'Y (VOL)
A805	27141033	SHORTED PIN
⚠ T901	2300311	NPT-995G, POWER TRANSFORMER [G]
	2300312	NPT-995DG, POWER TRANSFORMER [W][X]
	2300313	NPT-885Q, POWER TRANSFORMER [A][B]
⚠ C901	3500065A	0.01μF, AC400V/125V, CAPACITOR (IS)
C901a	27300601	SB-1925, COVER (CAPACITOR)
⚠ S901	25065340	NSS-0001, SWITCH
⚠ S903	25065123	NSS-1258P, SLIDE SWITCH [W][X]
⚠ P901	253148 or	AS-CEE, POWER SUPPLY CABLE [G][W][B][X]
	253150	AS-CEE, POWER SUPPLY CABLE [G][W][B][X]
	253118	AS-SAA, POWER SUPPLY CABLE [A]
⚠ P902	25050337	NSCT-2P164, AC SOCKET [G][W][B][X]
	25050346	NSCT-2P173, AC SOCKET [A]
P903	25060044	GROUND TERMINAL
F501, F502	252077 or	4A-SE-EAK, SPEAKER FUSE [G][W][A][B][X]
	252077CC	4A-SE-EAK, SPEAKER FUSE [G][W][A][B][X]
⚠ F902	252074 or	2A-SE-EAK, PRIMARY FUSE [G][W][A][B][X]
	252074CC	2A-SE-EAK, PRIMARY FUSE [G][W][A][B][X]
⚠ F903	252075 or	2.5A-SE-EAK, SOCKET FUSE[G]
	252075CC	2.5A-SE-EAK, SOCKET FUSE[G]
⚠ F903a	25050211	H0445, FUSE HOLDER [G]
	29360405	T2.5A/250V, FUSE LABEL [G]
⚠ F904	252049	4A(ST-6), PRIMARY FUSE [W][X]
U1	1A086554-3	NAAF-3054-3, EQUALIZER CIRCUIT PC BOARD ASS'Y
U2	1A103555-3	NAAF-3055-3, EQUALIZER SWITCH PC BOARD ASS'Y [G][A][B]
	1A103555-3A	NAAF-3055-3A, EQUALIZER SWITCH PC BOARD ASS'Y [W][X]
U3	1A103557-2	NAETC-3057-2, HEAD PHONE CIRCUIT PC BOARD ASS'Y
U5	1A103560-1	NAETC-3060-1, REMOTE CONTROL TERMINAL PC BOARD ASS'Y
U6	1A103561-3	NASW-3061-3, CONTROL CIRCUIT PC BOARD ASS'Y
U7	1A103562-2	NADIS-3062-2, DISPLAY OF VOLUME PC BOARD ASS'Y
U8	1A103563-3	NAETC-3063-3, VOLUME CONTROL CIRCUIT PC BOARD ASS'Y

NOTE: [G]: ONLY 220V MODEL
[W]: ONLY 120V/220V MODEL
[X]: ONLY MILITARY MARKET MODEL
[A]: ONLY AUSTRALIAN MODEL
[B]: ONLY BRITISH MODEL

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

FRONT PANEL FACILITIES



1. Slective Tone Switch (TWIN TURBO)
2. Surround Switch (SURROUND)
3. Bass Control Knob (BASS)
4. Treble Control Knob (TREBEL)
5. Input Selector and CD Direct Buttons (INPUT SELECTOR, CD DIRECT)
   PHONO, TUNER, VIDEO/CDV, TAPE, DAT, CD OR CD DIRECT
6. Volume Control (VOLUME) and Indicator
7. Headphone Jack (PHONES)
8. Audio Muting Button (MUTING)
9. Recording Selector Button (REC SELECTOR)
   SOURCE, PHONO, CD, TUNER, VIDEO, DAT
10. Balance Control Knob (BALANCE)

a. Muting Indicator
b. Input Selector Display
c. Selective Tone Indicator (TWIN TURBO)
d. Surround Indicator
e. Full Synchro Dubbing Indicator
f. Recording Selector Indicators

PRINTED CIRCUIT BOARD PARTS LIST

EQUALIZER CIRCUIT PC BOARD (NAAF-3054-3) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q071	22240050	μPC4570C
	Capacitors	
C071, C072	354780229	2.2μF, 50V, Elect.
C077, C078	354721019	100μF, 6.3V, Elect.
C083, C084	354780229	2.2μF, 50V, Elect.
C085, C086	354742219	220μF, 16V, Elect.
	Plug	
P071	25055334	NPLG-9P317

EQUALIZER SWITCH PC BOARD (NAAF-3055-3, NAAF-3055-3A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	22240079	LC7821
Q302	22240081	LC7822
Q503	222073	STK4191V
Q621	22240025	LC4966
	Transistors	
Q501, Q502	2212285 or	2SC2878A or
	2212286	2SC2878B
Q622	2211255 or	2SC1815GR or
	2210746	2SC945A-P
Q623	2211455 or	2SA1015GR or
	2210803	2SA733P
Q631	2211255 or	2SC1815GR or
	2210746	2SC945A-P
Q911, Q913	2201404 or	2SD1406Y or
	2201405	2SD1406GR
Q912	2201393 or	2SB1015O or
	2201394	2SB1015Y
	Diodes	
D631	223163	1SS133
D911~D914	223897 or	P300DL or
	22380003	1N5402F
D915	224151302 or	05AZ13Y or
	224651302 or	HZ13EB2 or
	224451302	MTZ13B
D916	224152003 or	05AZ20Z or
	224652003 or	HZ20EB3 or
	224452003	MTZ20C
D917	224150562 or	05AZ5.6Y or
	224650562 or	HZ5.6EB2 or
	224450562	MTZ5.6B
D918	224151301 or	05AZ13X or
	224651301 or	HZ13EB1 or
	224451301	MTZ13A
D931, D932	223880 or	GP101N4003 or
	223896	1N4003F
	Coils	
L531, L532	231001	S-1.3B
	Capacitors	
C351	354780229	2.2μF, 50V, Elect.
C352, C353	354780339	3.3μF, 50V, Elect.
C501, C502	354780479	4.7μF, 50V, Elrct.
C505, C506	354741019	100μF, 16V, Elect.
C509, C510	354784709	47μF, 50V, Elect.
C511, C512	371124734	0.047μF, 50V, Mylar
C515, C516	354781009	10μF, 50V, Elect.
C519		
C517, C518	354782219	220μF, 50V, Elect.
C911, C912	3504206	10000μF, 50V, Elect.
C913, C914	354782219	220μF, 50V, Elect.
C915	354741019	100μF, 16V, Elect.
C916	354761019	100μF, 35V, Elect.
C919	354742219	220μF, 16V, Elect.
C920	354754719	470μF, 25V, Elect.
C921	354782219	220μF, 50V, Elect.
C922	354742219	220μF, 16V, Elect.
C923, C925	354722219	220μF, 6.3V, Elect.
C931	354781019	100μF, 50V, Elect.
	Resistors	
R509~R512	442523324	3.3KΩ, 1/2W, Metal oxide film
R513, R514	441520474	4.7Ω, 1/2W, Metal oxide film
R515, R516	442521014	100Ω, 1/2W, Metal oxide film
R533, R534	441621004	10Ω, 1W, Metal oxide film
R631	441626814	680Ω, 1W, Metal oxide film
R911	441622714	270Ω, 1W, Metal oxide film
R912	441525104	51Ω, 1/2W, Metal oxide film
R913	442525124	5.1KΩ, 1/2W, Metal oxide film
R914	441523624	3.6KΩ, 1/2W, Metal oxide film
R915	441721514	150Ω, 2W, Metal oxide film
R916	441622014	200Ω, 1W, Metal oxide film
R917	442526224	6.2KΩ, 1/2W, Metal oxide film
R932	441622224	2.2KΩ, 1W, Metal oxide film
	Relay	
RL501	25065134	NRL-2P5A-DC24-07
	Terminals	
P301, P302	25045213	NPJ-6PDBL-92
P303, P304	25045171	NPJ-4PDBL-65
P501	25060094	NTM-8PDML35
	25060092	NTM-1533
	Plug	
P401a	25055133	NPLG-3P117
	Jumper sockets	
JL401a, JL402a	25050270	NSCT-6P-98
JL403a, JL408a	25050272	NSCT-8P-100
JL406a	25050267	NSCT-3P-95
	Glass tube	
	79086A	ESG-3
	Bracket	
	27141059	
	Fuse holders	
	25050065	YSH403T
	250113	SN5051 [W][X]

HEAD PHONE CIRCUIT PC BOARD (NAETC-3057-2) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R531, R532	441623914	390Ω, 1W, Metal oxide film
	Jack	
P502	25045232	HLJ4307-01-3140

REMOTE CONTROL TERMINAL PC BOARD (NAETC-3060-1) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Miniature jack	
P851	25045172	HSJ1003-01-020

CONTROL CIRCUIT PC BOARD (NASW-3061-3) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401~Q441	22240050	μPC4570C
Q461	222502 or	NJM4558DX or
	222811	NJM4558DD
Q851	22240080	LC6554H-3428
	Transistors	
Q611, Q852	2211455 or	2SA1015GR or
Q882	2210803	2SA733P
Q624, Q881	2211255 or	2SC1815GR or
Q891	2210746	2SC945A-P
	FL tube	
Q853	212041	7-BT-85GK
	Diodes	
D621	225141	SEL2213C, LED
D622, D852	223163	1SS133
D891		
D851	224150562 or	05AZ5.6Y or
	224650562 or	HZ5.6EB2 or
	224450562	MTZ5.6B, Zener
D853	224150513 or	05AZ5.1Z or
	224650513 or	HZ5.1EB3 or
	224450513	MTZ5.1C, Zener
	Osc. element	
	3010099	CSA4.00MG
	Capacitors	
C401, C402	354780229	2.2μF, 50V, Elect.
C409, C410		
C423, C424		
C461, C462		
C465, C469		
C470		
C407, C408	354780339	3.3μF, 50V, Elect.
C441, C442		
C445, C446		
C421, C422	371128224	8200pF, 50V, Mylar
C425, C426	371125134	0.051μF, 50V, Mylar
C443, C444	371122234	0.022μF, 50V, Mylar
C449, C450		
C611	354780109	1μF, 50V, Elect.
C643	354742209	22μF, 16V, Elect.
C853, C857	354761009	10μF, 35V, Elect.
C858		
C856	354721019	100μF, 6.3V, Elect.
C891	354781009	10μF, 50V, Elect.
C892	354780479	4.7μF, 50V, Elect.
	Resistors	
R441, (R442)	5104208	N16RGHC100KWT20Z Variable
R449, (R450)		
R477	5104182	N16RMC250KW20Z Variable
	Switch	
S421, (S461)	25035569	NPS-242-L531
S851~S859	25035548	NPS-111-S510
	Socket ass'y	
P401	2000523	NSAS-6P479
P641	2000635A	NSAS-4P591
	Holder	
	27190550A	(LED-1)
	Cushion	
	28140778	t8×100×11

DISPLAY OF VOLUME PC BOARD (NADIS-3062-2) PARTS LIST

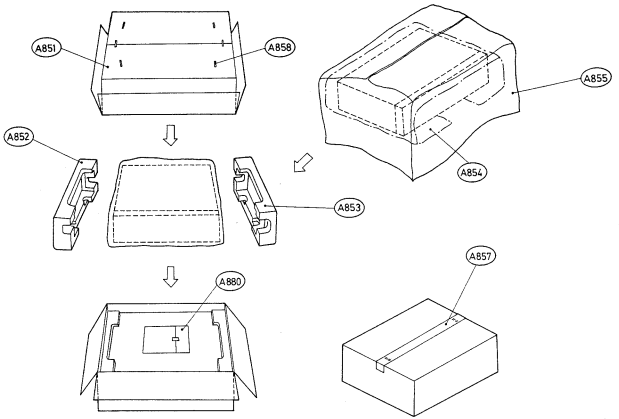
CIRCUIT NO.	PART NO.	DESCRIPTION
	Diode	
D641	225241 or	SEL2210R-C or
	225242	SEL2210R-D, LED
	Holder	
	27190545 (LED)	

VOLUME CONTROL CIRCUIT PC BOARD (NAETC-3063-3) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q641	222963	LB1630
	Capacitor	
C641	354741009	10μF, 16V, Elect.
	Resistors	
R479, (R480)	5104210	N16RGM50KD30F, Variable
	Plate (Bus)	
	27141059	

NOTE [W]: Only 120V/220V model
[X]: Only Military market model

PACKING PROCEDURES

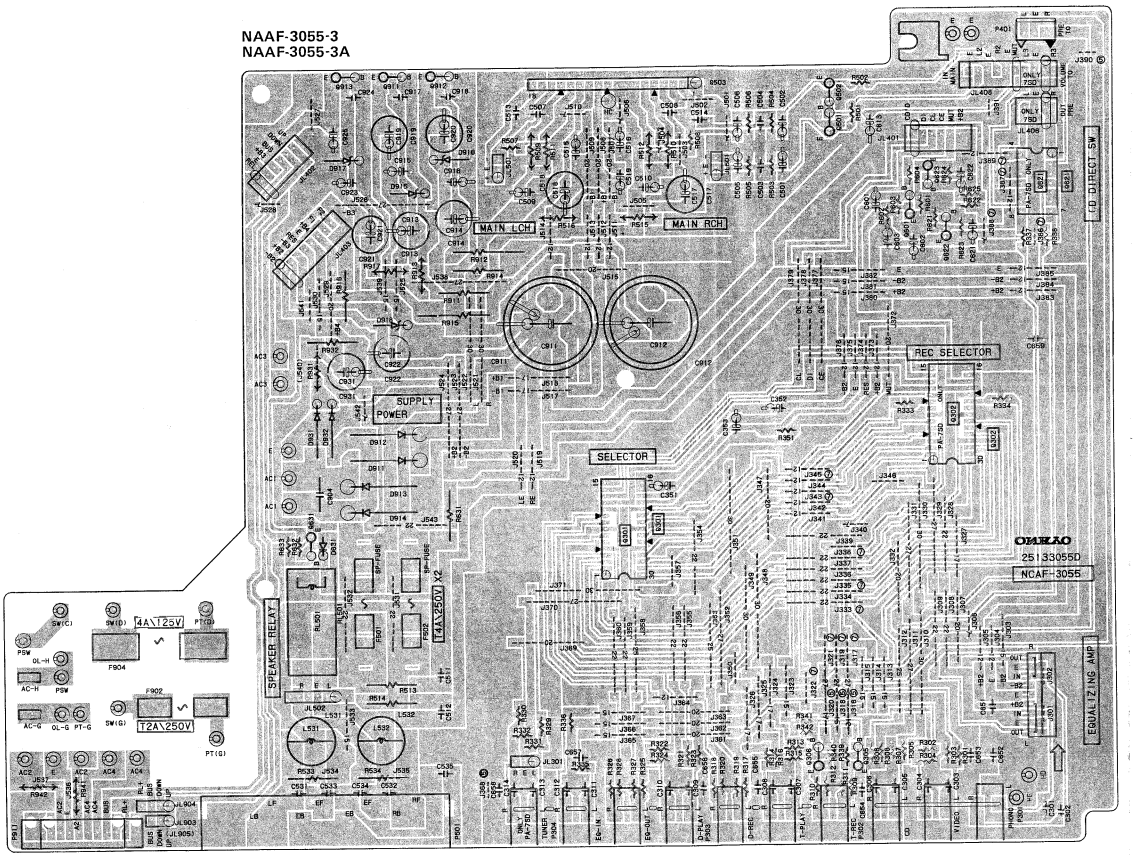


REF. NO.	PART NO.	DESCRIPTION
A851	29051699	MASTER CARTON BOX
	29051744	MASTER CARTON BOX [XD][XG]
A852	29091268	PAD, LEFT
A853	29091269	PAD, RIGHT
A854	29100063	500×750, POLY BAG
A855	282301	SEALING HOOK
A856	260012	W=50mm, DAMPLON TAPE
A857	261504	W=30mm, PAPER TAPE
	29360815	LABEL (120), AC CABLE [XD]
	29360816	LABEL (220), AC CABLE [XG]
A900	ACCESSARY BAG ASS'Y	
	29341246	INSTRUCTION MANUAL [G][W][XD][XG]
	29341270	INSTRUCTION MANUAL [G][W]
	29365021	WARRANTY CARD [XD][XG]
	29365022	WARRANTY CARD [B]
	29358002F	SERVICE STATION LIST [XD][XG]
	29100006A	350×250, POLY-VINYL BAG
	29380084	CAUTION (120) [XD]
	29380085	CAUTION (220) [XG]

NOTE [G]: ONLY 220V MODEL
[W]: ONLY 120V/220V MODEL
[XD]: ONLY MILITARY MARKET, 120V SETTING MODEL
[XG]: ONLY MILITARY MARKET, 220V SETTING MODEL
[A]: ONLY AUSTRALIAN MODEL
[B]: ONLY BRITISH MODEL

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

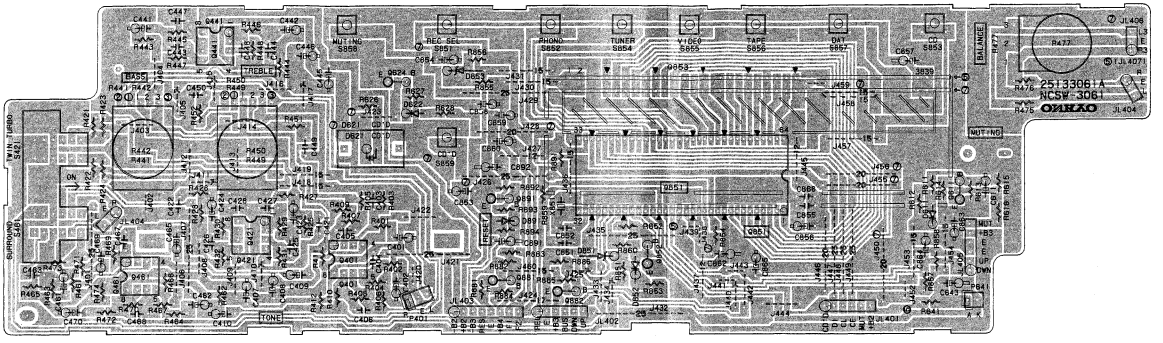
NAAF-3055-3
NAAF-3055-3A



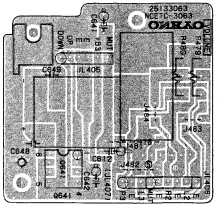
NADIS-3062-2

NAETC-3060-1

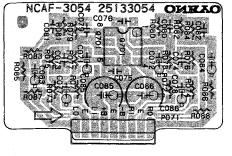
NASW-3061-3



NAETC-3063-3

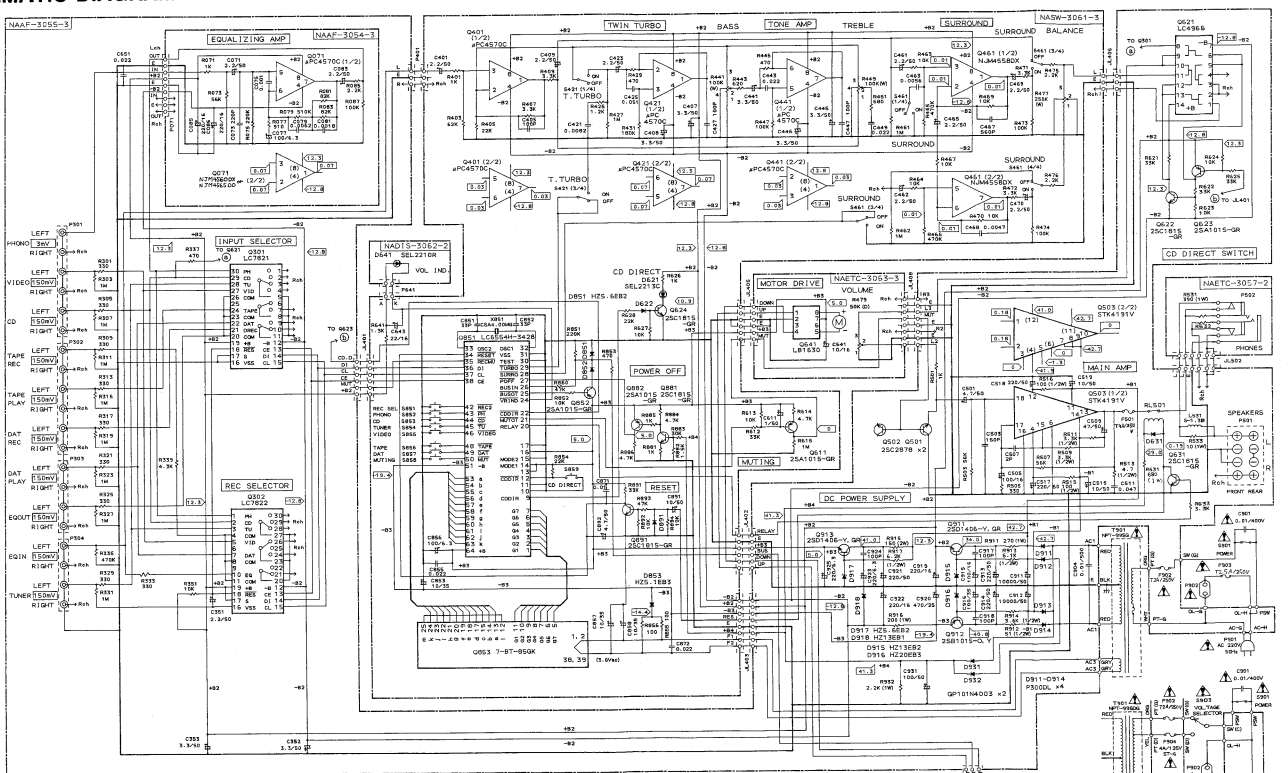


NAAF-3054-3



NAETC-3057-2

SCHEMATIC DIAGRAM

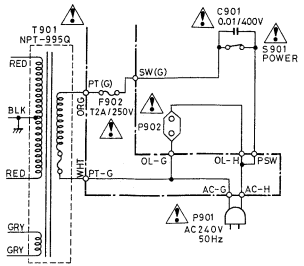


-NOTES-
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF/50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (●) ARE IN μF/WV.
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURING WITH V.T.V.M. (—DV IS DC VOLTAGE NO INPUT SIGNALS).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

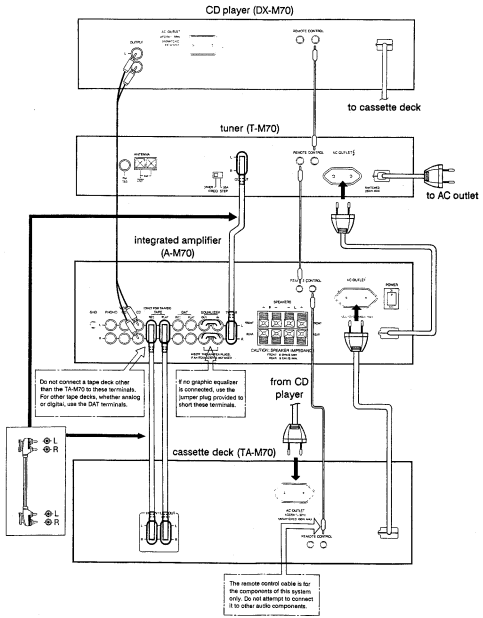
2SC1815 2SA1015 2SC2878 | 2SB1015 2SD1406 | NJM4558DX μPC4570C LB1630 | LC4966 | LC7821 LC7822 | LC6554H-3428 | STK4191V

ONKYO CORPORATION

240V Model



SYSTEM CONNECTIONS


CD player (DX-M70)
to cassette deck
tuner (T-M70)
to AC outlet
integrated amplifier
(A-M70)
Do not connect a tape deck other than the TA-M70 to these terminals. For other tape decks, whether analog or digital, use the DAT terminals.
If no graphic equalizer is connected, use the jumper plug provided to short these terminals.
from CD player
cassette deck (TA-M70)
The remote control cable is for the components of this system only. Do not attempt to connect it to other audio components.

ONKYO CORPORATION

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